APPENDIX

R. Pile Installation Work Plan

New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau D, 12th Floor
625 Broadway, Albany, New York 12233-7013
Phone: (518) 402-9676 • **Fax:** (518) 402-9020
Website: www.dec.ny.gov

Joe Martens
Commissioner

March 6, 2015

Mr. Charles Brooks, P.E.
C&S Engineers, Inc.
499 Col. Eileen Collins Blvd
Syracuse, NY 13212-3903

Re: Onondaga County Amphitheater - Update to Pile Installation Work Plan

Dear Mr. Brooks:

The New York State Department of Environmental Conservation (NYSDEC) has reviewed the Onondaga County Lakeview Amphitheater – Update to Pile Installation Work Plan letter submitted on March 2, 2015 and the revised specification for the steel piles transmitted via email from Matthew Simone of Gilbane on March 4, 2015. This work plan was submitted per direction provided by NYSDEC in relation to this change of use for the Solvay Wastebeds 1-8 Site (Inactive Hazardous Waste Site #734081).

We note that the installation methods and pile locations are not substantially different from those presented in the October 22, 2014 letter submitted by Robert Palladine of C&S, which we had no comments on as indicated in my November 22, 2014 letter. Therefore, NYSDEC has no comments regarding the installation methods and pile locations described in these updated submissions. In addition, please note that this NYSDEC review does not include the cathodic protection details included in the letter since they do not bear on the remedial program for the site. If you have any questions or need additional information, please contact me at 518-402-9796.

Sincerely,

Tracy A. Smith

Tracy A. Smith
Project Manager

ecc: D. Hesler, NYSDEC
M. Simone, Gilbane
L. Bacher, Gilbane
B. Palladine, C&S
T. Roger, Gilbane
C. Reinhardt, Gilbane
B. Duclos, C&S
A. Wixson, Onondaga Cnty.
J. Mark Astheimer, Gilbane

March 02, 2015

Chuck Brooks, P.E., P.Eng.
Senior Project Engineer
C&S Companies
499 Col. Eileen Collins Blvd.
Syracuse, New York 13212

Transmitted: Via Electronic Correspondence

Reference: Onondaga County Lakeview Amphitheater – Update to Pile Installation Work Plan

Dear Mr. Brooks,

For submission to the New York State Department of Environmental Conservation (NYSDEC), this correspondence and the attached is Gilbane Building Company's (Gilbane) update to the pile installation work plan previously submitted by C&S Engineers, Inc. (C&S) on October 22, 2014.

Included are the following documents:

i. Specification Section 316216 Steel Piles; dated February 25, 2015
ii. Updated Contract Drawings
    a. Signed and stamped, Amphitheater Pavilion and Stage House Pile & Pile Cap Plan St-100a; dated February 23, 2015
    b. Signed and stamped, Back of House Pile & Pile Cap Plan, Sections and Details St-100b; dated February 23, 2015
iii. Test Pile Location Plan; dated February 27, 2015 as prepared by John P. Stopen Engineering
iv. Cathodic Protection Details (preliminary); dated February 25, 2015 as prepared by CorrTech, Inc.
    a. CP-1 Planview
    b. CPD-1 Detail Drawings
    c. CP-1 Deepwell Anode Assembly

As discussed during progress meetings, the design has deviated from the initial work plan submission made by C&S. Specifically, the piles shall no longer require coal-tar epoxy, as the design now utilizes a cathodic protection system. The cathodic protection system is recommended as the long-term preferred solution for the project.

In summary of our approach to protection of the piles, Gilbane retained CorrTech, Inc. (CorrTech) to perform a corrosion assessment for the Onondaga Lakeview Amphitheater Project located at the Onondaga Lake (in the Town of Geddes, New York). The construction site is located on the western shore of Onondaga Lake sited on an area of solvay waste.

Based on the recommendation of CorrTech, the intent is for the project design to incorporate a cathodic protection system for the foundations of the amphitheater structure. This will be in lieu of requiring coal-tar epoxy for the piles.

Of primary reason for conducting the assessment, is the corrosion exposure of critical buried infrastructure associated with the amphitheater construction. Soil borings and analysis were presented in the report "Geotechnical Subsurface Investigation Data" dated September 2014, prepared by C&S. Three (3) soil borings were utilized to perform corrosivity evaluation of soils. The area was originally created to accept waste material generated as a result of the production of soda ash. The waste material is commonly referred to as "Solvay Waste" (SOLW) which is a chalky material consisting mainly of calcium carbonate with gypsum, sodium chloride, and calcium chloride. The depth of this layer is approximately 60-ft.

Test results indicate that the proposed amphitheater will be constructed in an environment that is considered to be corrosive to metallic infrastructure installed at this site.

Soil resistivity measurements were obtained at three (3) boring locations, LVA-B06, T-2 and T-3, LVA- B07 S-5 and S-12 and LVA-B10, T-2. Soil resistivity values were determined to be 110, 155 and 147 ohm-cm respectively. The measurement of media resistivity has been commonly used within the industry as an indicator of the corrosivity of soil or water. Resistivity is the reciprocal of conductivity, the lower the resistivity, the easier current will flow through the soil or water. Of the measurable soil characteristics, resistivity is generally accepted as the primary indicator of soil corrosivity. Resistivity is a property of the bulk volume of soil and electrolytes.

Although no standard has been developed and accepted by such organizations as the American Society for Testing and Materials or the National Association of Corrosion Engineers, it is generally agreed that the classification shown below, or other similar classifications, reflect soil corrosivity:

Table 1.0 (Soil Corrosivity Classification)

Resistivity (Ohm-Cm)	Corrosivity
below 500	Very Corrosive
500 to 1,000	Severely Corrosive
1,000 to 2,000	Moderately Corrosive
2,000 to 10,000	Mildly Corrosive
Above 10,000	Progressively Less Corrosive

The above table (Table 1.0) provides qualitative insight to the expected corrosion exposure of a metallic structure in a soil of known resistivity. Accordingly, deterioration can generally be expected to be rapid and relatively severe in soils below 1,000 ohm-cm. For the solvay material and surrounding area, it is considered that the low resistivity value is the result of salt content. This was not evaluated in the soil assessment.

Additional analysis of the soil sample water performed for pH; easured values were 12.60, 12.67 and 8.70 for the three (3) samples. Per CorrTech, these values are not considered aggressive to buried steel and in fact, the higher values would passivate the steel so that corrosion is not initiated. This is the condition for embedded reinforcing steel in concrete bridge construction. As long as the passivating layer remains intact, corrosion is abated. With available water and chlorides reaching the steel surface, bridge reinforcing steel corrodes, a condition readily observed in the north-east. Within the solvay waste, there is much water and salt available to corrode any steel despite the high pH.

Sulfate and redox values were not of concern for steel or reinforced concrete structures. High levels of chloride and moisture are of concern for steel pilings and concrete reinforcing steel. Based on the extremely low resistivity values (110 – 147 Ohm-cm), CorrTech has stated that the chloride concentrations are most-likely high at the site location. The following table (Table 2.0) provides general resistivity values of typical waters:

Table 2.0 (General Resistivity Values of Typical Waters)

Water	Resistivity (Ohm-cm)
Pure water	20,000,000
Distilled water	500,000
Rain water	20,000
Tap water	1,000 – 5,000
River water (brackish)	200
Sea water (coastal)	30
Sea water (open sea)	20 - 25

Corrosion would be expected to be a problem on any metallic or reinforced concrete infrastructure buried at the amphitheater site. The following discussion/solution is presented:

H Piles Cathodic Protection

Aggressive corrosion should be considered for the proposed H pile support structure, ultimately resulting in a structurally deficient structure without proper corrosion control. At the recommendation of CorrTech, the project shall now incorporate the application of impressed current cathodic protection. This is targeted to address the entire H pile system and reinforced concrete steel in contact with the soil. For the 215 H piles to be installed in water and soil, cathodic protection would provide long term corrosion control for the environmental exposure.

Additional corrosion mitigation would be provided to the reinforcing steel in the concrete grade beams, pile caps and other foundation structures exposed to soil. Impressed current reverses the negatively charged chloride ion flow away from the steel by charging the structure, reinforcing steel, negative. Without cathodic protection, chloride ions and other anions deposited on a concrete surface will migrate through the concrete over time, reaching the reinforcing steel surface. When this occurs, local corrosion cells are established on the reinforcing steel

Corrosion of the reinforcing steel results in expansive forces within the concrete structure. These expansive forces ultimately exceed the tensile strength of the concrete cover thickness causing the concrete to crack, allowing further ingress of chloride ions resulting in continued concrete deterioration of the structure.

Application of cathodic protection is a proven electrochemical method for arresting corrosion on metallic and concrete structures. Cathodic protection converts all active anode sites on the structure, the areas that corrode, into cathode sites that do not corrode. New anode sites are provided through the installation of anode groundbeds.

Energy for an impressed current system is provided by a power supply or rectifier. This is an electrical device which converts AC power to DC power. The rectifier provides a positive current supply to the anodes and a negative current return from the structure. For this circuit, Ohms law applies: E=IR, where E is the driving voltage of the rectifier output voltage, I is the current magnitude that results from the resistance of the circuit R. Proper system design seeks to minimize the resistance of the circuit through anode groundbed design. Impressed current systems are capable of small to very large energy output levels through proper design. This range of ability allows protection possibilities for poorly coated pipe, large structures, automatic control and other options in design and operation.

Formal acknowledgment of this correspondence as acceptance and approval of the deviation to the initially work plan is kindly requested. Please do not hesitate to call or e-mail with any questions or request for additional information.

Regards,

Matthew J. Simone
Gilbane Building Company

Cc: Archie Wixson, Onondaga County
Robert Duclos, C&S Companies
Robert M. Palladine, Jr., C&S Companies
Thomas Rogér, Gilbane Building Company
J. Mark Astheimer, Gilbane Building Company
Larry Bacher, Gilbane Building Company
Charlie Reinhardt, Gilbane Building Company

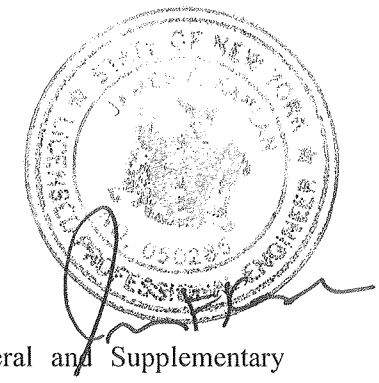
Encl.: Specification Section 316216 Steel Piles; dated February 25, 2015
Amphitheater Pavilion and Stage House Pile & Pile Cap Plan St-100a; dated February 23, 2015
Back of House Pile & Pile Cap Plan, Sections and Details St-100b; dated February 23, 2015

Test Pile Location Plan; dated February 27, 2015 as prepared by John P. Stopen Engineering
Cathodic Protection Details (preliminary); dated February 25, 2015 as prepared by CorrTech, Inc. (CP-1 Planview, CPD-1 Detail Drawings, and CP-1 Deepwell Anode Assembly)

GILBANE BUILDING COMPANY
221 S.Warren St., Syracuse New York 13202

i. ~~Specification Section 316216 Steel Piles; dated February 25, 2015~~

Superseded; March 3, 2015 [M.Simone]



SECTION 316216 - STEEL PILES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes steel H piles.

1.3 UNIT PRICES

A. Contract Sum: Base Contract Sum on number and types of piles indicated on drawings having the design load indicated.

B. Work of this Section is affected as follows:

1. Additional payment for number of piles in excess of that indicated, and credit for number of piles less than that indicated, is calculated at unit prices stated in the Contract.
2. Unit prices include labor, materials, tools, equipment, and incidentals for furnishing, driving, cutting off, capping, and disposing of cutoffs.
3. Test piles that become part of permanent foundation system are considered as an integral part of the Work.
4. No payment is made for rejected piles, including piles driven out of tolerance, defective piles, or piles damaged during handling or driving.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For steel H piles. Show fabrication and installation details for piles, including details of driving points, splices, and pile caps.

1. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld.
2. Include dynamic test pile locations. Submit wave equation analysis data signed and sealed by the qualified professional engineer responsible for their preparation confirming

that the pile driving equipment is suitable for installing piles to a driving resistance of twice the design load.

C. Dynamic Load Test Report, signed by NYS Professional Engineer, documenting design load for dynamic test piles. Dynamic pile testing specialist to be retained and paid by Owner.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and Dynamic pile testing agency.

B. Welding certificates.

C. Mill Test Reports: For steel H piles, steel castings, and steel plate, signed by manufacturer.

D. Pile-Driving Equipment Data: Include type, make, and rated energy range; weight of striking part of hammer; weight of drive cap; and, type, size, and properties of hammer cushion.

E. Dynamic Pile Test Reports: Submit within three days of completing each test.

F. Pile-Driving Records: Submit within three days of driving each pile.

G. Certified Piles Survey: Submit within **seven** days of pile driving completion.

H. Field quality-control reports.

I. Preconstruction Photographs: Photographs or video of existing conditions of adjacent construction. Submit before the Work begins.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by pile driving equipment manufacturer.

1. Installer's responsibility includes engaging a qualified professional engineer to prepare pile-driving records for dynamic test piles and for each production pile.

2. Installer's responsibility includes engaging qualified inspector to prepare welding report for pile splices

B. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated and accredited by IAS or ILAC Mutual Recognition Arrangement as complying with ISO/IEC 17025.

C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.8 PRECONSTRUCTION TESTING

A. General: Dynamic pile tests are used to verify driving criteria and pile lengths and to confirm allowable load of piles.

1. Furnish 24 dynamic test piles 60 inches (1524 mm) longer than production piles.
2. Determination of actual length of piles is based on results of dynamic pile tests.
3. Test Piles may be production piles and incorporated into final structure.

B. Pile Tests: Arrange and perform the following pile tests:

1. High-Strain Dynamic Testing of Piles: ASTM D 4945.

C. Drive test piles at locations indicated to the minimum penetration or driving resistance indicated. Use test piles identical to those required for Project, and drive with appropriate pile-driving equipment operating at rated driving energy to be used in driving permanent piles.

1. Pile Design Load: As indicated on drawings – 120 tons, and 220 tons. Piles are to be driven to bear on rock.

D. Approval Criteria: Allowable load shall be the load acting on the test pile when the lesser of] the following criteria are met, divided by a factor of safety of 2, and as determined by the dynamic pile testing specialist:

1. Net settlement, after deducting rebound, of not more than 0.01 inch/ton (0.25 mm/907 kg) of test load.
2. Total settlement exceeds the pile elastic compression by 0.15 inch (4 mm), plus 1.0 percent of the tip diagonal dimension.
3. A plunging failure or sharp break in the load settlement curve.
4. Piles are to be driven to practical refusal, as determined by driving criteria established by the dynamic pile testing specialist.

E. Test Pile-Driving Records: Prepare driving records for each test pile, compiled and attested to by a qualified professional engineer. Include same data as required for driving records of permanent piles.

F. Test piles that comply with requirements, including location tolerances, may be used on Project.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver piles to Project site in such quantities and at such times to ensure continuity of installation. Handle and store piles at Project site to prevent buckling or physical damage.

1.10 FIELD CONDITIONS

A. Protect structures, underground utilities, and other construction from damage caused by pile driving.

B. Site Information: A geotechnical report has been prepared for this Project and is available from Gilbane Building Company.

C. Preconstruction Photographs: Inventory and record the condition of adjacent structures, underground utilities, and other construction. Document conditions that might be misconstrued as damage caused by pile driving. Comply with Section 013233 "Photographic Documentation."

PART 2 - PRODUCTS

2.1 STEEL H PILES

A. High-Strength, Low-Alloy, Columbium-Vanadium Structural Steel: ASTM A 572/A 572M, Grade 50 (Grade 345).

1. Manufacturers: Subject to compliance with requirements,

2.2 PILE ACCESSORIES

A. Driving Points: Manufacturer's standard one-piece driving point, fabricated from steel castings as follows to provide full bearing of web and flange of pile tip:

1. High-Strength Steel Castings: ASTM A 148/A 148M, Grade 90-60 (Grade 620-415).

B. Splice Unit: Use full penetration weld for splicing sections of piling, as indicated on drawings.

2.3 FABRICATION

A. Fabricate and assemble piles in shop to greatest extent possible.

B. Pile-Length Markings: Mark each pile with horizontal lines at 12-inch (305-mm) intervals; label the distance from pile tip at 60-inch (1524-mm) intervals. Maintain markings on piles until driven. Bottom 100 ft of piles may be marked at 5 ft intervals.

C. Fabricate full-length piles by splicing lengths of steel H pile together. Accurately mill meeting ends of piles and bevel for welding. Maintain axial alignment of pile lengths. Maintain structural properties of pile across splice.

1. Continuously Welded Splices: Splice piles by continuously welding according to AWS D1.1/D1.1M for procedures, appearance and quality of welds, and methods used in correcting welding work.
2. Splice piles during field installation.

D. Fit and weld driving points to tip of pile according to manufacturer's written instructions and AWS D1.1/D1.1M for procedures, appearance and quality of welds, and methods used in correcting welding work.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Site Conditions: Do not start pile-driving operations until earthwork fills have been completed or excavations have reached an elevation of 6 to 12 inches (152 to 305 mm) above bottom of footing or pile cap.

3.2 DRIVING EQUIPMENT

A. Pile Hammer: Air-, steam-, hydraulic-, or diesel-powered type capable of consistently delivering adequate peak-force duration and magnitude to develop the ultimate capacity required for type and size of pile driven and character of subsurface material anticipated.

B. Hammer Cushions and Driving Caps: Between hammer and top of pile, provide hammer cushion and steel driving cap as recommended by hammer manufacturer and as required to drive pile without damage.

C. Leads: Use fixed, semifixed, or hanging-type pile-driver leads that hold the full length of pile firmly in position and in axial alignment with hammer.

3.3 DRIVING PILES

A. General: Continuously drive piles to elevations or penetration resistance established by dynamic load testing of piles. Establish and maintain axial alignment of leads and piles before and during driving.

B. Heaved Piles: Redrive heaved piles to tip elevation at least as deep as original tip elevation with a driving resistance at least as great as original driving resistance.

C. Driving Tolerances: Drive piles without exceeding the following tolerances, measured at pile heads:

1. Location: 2 inches (102 mm) from location indicated after initial driving, and 3 inches (152 mm) after pile driving is completed.
2. Plumb: Maintain 1 inch (25 mm) in 48 inches (1219 mm) from vertical, or a maximum of 4 inches (102 mm), measured when pile is aboveground in leads.
3. Batter Angle: Maximum 1 inch (25 mm) in 48 inches (1219 mm) from required angle, measured when pile is aboveground in leads.

D. Abandon and cut off rejected piles as directed by Engineer. Leave rejected piles in place, and install new piles in locations as directed by Engineer.

E. Cut off tops of driven piles square with pile axis and at elevations indicated.

F. Pile-Driving Records: Maintain accurate driving records for each pile, compiled and attested to by a qualified professional engineer. Include the following data:

1. Project name and number.

2. Name of Contractor.
3. Pile location in pile group and designation of pile group.
4. Date and time
5. Sequence of driving in pile group.
6. Pile dimensions.
7. Ground elevation.
8. Elevation of tips after driving.
9. Final tip and cutoff elevations of piles after driving pile group.
10. Records of redriving.
11. Elevation of splices.
12. Type, make, model, and rated energy of hammer.
13. Weight and stroke of hammer.
14. Type of pile-driving cap used.
15. Cushion material and thickness.
16. Actual stroke and blow rate of hammer.
17. Pile-driving start and finish times, and total driving time.
18. Time, pile-tip elevation, and reason for interruptions.
19. Number of blows for every 12 inches (305 mm) of penetration, and number of blows per 1 inch (25 mm) for the last 6 inches (152 mm) of driving.
20. Pile deviations from location and plumb.
21. Preboring, jetting, or special procedures used.
22. Unusual occurrences during pile driving.

G. Certified Piles Survey: Engage a land surveyor to prepare a piles survey showing final location of piles in relation to the property survey and existing benchmarks.

1. Notify Engineer when deviations from locations exceed allowable tolerances.

3.4 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:

1. Pile foundations.
2. Welded splices.

B. Testing Agency: Owner will engage a qualified testing agency to perform inspections and perform dynamic pile testing.

C. Tests and Inspections:

1. Dynamic Pile Testing: High-strain dynamic monitoring shall be performed and reported according to ASTM D 4945 during initial driving of at least 5 piles of each design load and during restriking. Test other piles during initial driving or during restriking (total number of test piles = 24). Test piles locations are shown in Figure 1-316216. Scope of testing may be reduced by Engineer-of-Record in response to actual conditions and test results. Locations of test piles may be revised by mutual agreement between Engineer-of-Record and contractor.
2. Weld Testing: In addition to visual inspection, welds shall be tested and inspected according to AWS D1.1/D1.1M and inspection procedures listed below, at testing

agency's option. Correct deficiencies in Work that test reports and inspections indicate do not comply with the Contract Documents.

a. Liquid Penetrant Inspection: ASTM E 165.
b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
c. Radiographic Inspection: ASTM E 94, minimum quality level "2-2T."
d. Ultrasonic Inspection: ASTM E 164.

D. Steel H piles will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports.

3.5 DISPOSAL

A. Remove cutoff sections of piles from site, and legally dispose of them off Owner's property.

END OF SECTION 316216

SECTION 316216 - STEEL PILES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes steel H piles.

1.3 UNIT PRICES

A. Contract Sum: Base Contract Sum on number and types of piles indicated on drawings having the design load indicated.

B. Work of this Section is affected as follows:

1. Additional payment for number of piles in excess of that indicated, and credit for number of piles less than that indicated, is calculated at unit prices stated in the Contract.
2. Unit prices include labor, materials, tools, equipment, and incidentals for furnishing, driving, cutting off, capping, and disposing of cutoffs.
3. Test piles that become part of permanent foundation system are considered as an integral part of the Work.
4. No payment is made for rejected piles, including piles driven out of tolerance, defective piles, or piles damaged during handling or driving.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For steel H piles. Show fabrication and installation details for piles, including details of driving points, splices, and pile caps.

1. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld.
2. Include dynamic test pile locations. Submit wave equation analysis data signed and sealed by the qualified professional engineer responsible for their preparation confirming

that the pile driving equipment is suitable for installing piles to a driving resistance of twice the design load.

C. Dynamic Load Test Report, signed by NYS Professional Engineer, documenting design load for dynamic test piles. Dynamic pile testing specialist to be retained and paid by Owner.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and Dynamic pile testing agency.

B. Welding certificates.

C. Mill Test Reports: For steel H piles, steel castings, and steel plate, signed by manufacturer.

D. Pile-Driving Equipment Data: Include type, make, and rated energy range; weight of striking part of hammer; weight of drive cap; and, type, size, and properties of hammer cushion.

E. Dynamic Pile Test Reports: Submit within three days of completing each test.

F. Pile-Driving Records: Submit within three days of driving each pile.

G. Certified Piles Survey: Submit within **seven** days of pile driving completion.

H. Field quality-control reports.

I. Preconstruction Photographs: Photographs or video of existing conditions of adjacent construction. Submit before the Work begins.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by pile driving equipment manufacturer.

1. Installer's responsibility includes engaging a qualified professional engineer to prepare pile-driving records for dynamic test piles and for each production pile.

2. Installer’s responsibility includes engaging qualified inspector to prepare welding report for pile splices

B. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated and accredited by IAS or ILAC Mutual Recognition Arrangement as complying with ISO/IEC 17025.

C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.8 PRECONSTRUCTION TESTING

A. General: Dynamic pile tests are used to verify driving criteria and pile lengths and to confirm allowable load of piles.

1. Furnish 27 dynamic test piles 60 inches (1524 mm) longer than production piles.
2. Determination of actual length of piles is based on results of dynamic pile tests.
3. Test Piles may be production piles and incorporated into final structure.

B. Pile Tests: Arrange and perform the following pile tests:

1. High-Strain Dynamic Testing of Piles: ASTM D 4945.

C. Drive test piles at locations indicated to the minimum penetration or driving resistance indicated. Use test piles identical to those required for Project, and drive with appropriate pile-driving equipment operating at rated driving energy to be used in driving permanent piles.

1. Pile Design Load: As indicated on drawings – 120 tons, and 220 tons. Piles are to be driven to bear on rock.

D. Approval Criteria: Allowable load shall be the load acting on the test pile when the lesser of] the following criteria are met, divided by a factor of safety of 2, and as determined by the dynamic pile testing specialist:

1. Net settlement, after deducting rebound, of not more than 0.01 inch/ton (0.25 mm/907 kg) of test load.
2. Total settlement exceeds the pile elastic compression by 0.15 inch (4 mm), plus 1.0 percent of the tip diagonal dimension.
3. A plunging failure or sharp break in the load settlement curve.
4. Piles are to be driven to practical refusal, as determined by driving criteria established by the dynamic pile testing specialist.

E. Test Pile-Driving Records: Prepare driving records for each test pile, compiled and attested to by a qualified professional engineer. Include same data as required for driving records of permanent piles.

F. Test piles that comply with requirements, including location tolerances, may be used on Project.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver piles to Project site in such quantities and at such times to ensure continuity of installation. Handle and store piles at Project site to prevent buckling or physical damage.

1. Painted Piles: Protect finish and touch up paint damage before driving piles.

1.10 FIELD CONDITIONS

A. Protect structures, underground utilities, and other construction from damage caused by pile driving.

B. Site Information: A geotechnical report has been prepared for this Project and is available from Gilbane Building Company.

C. Preconstruction Photographs: Inventory and record the condition of adjacent structures, underground utilities, and other construction. Document conditions that might be misconstrued as damage caused by pile driving. Comply with Section 013233 "Photographic Documentation."

PART 2 - PRODUCTS

2.1 STEEL H PILES

A. High-Strength, Low-Alloy, Columbium-Vanadium Structural Steel: ASTM A 572/A 572M, [**Grade 50 (Grade 345)**].

1. Manufacturers: Subject to compliance with requirements,

2.2 PILE ACCESSORIES

A. Driving Points: Manufacturer's standard one-piece driving point, fabricated from steel castings as follows to provide full bearing of web and flange of pile tip:

1. Carbon-Steel Castings: ASTM A 27/A 27M, [**Grade 65-35 (Grade 450-240), heat treated**] [**or**] [**Grade N1**].
2. High-Strength Steel Castings: ASTM A 148/A 148M, [**Grade 80-40 (Grade 550-275)**] [**or**] [**Grade 90-60 (Grade 620-415)**].

B. Splice Unit: Use full penetration weld for splicing sections of piling, as indicated on drawings.

2.3 FABRICATION

A. Fabricate and assemble piles in shop to greatest extent possible.

B. Pile-Length Markings: Mark each pile with horizontal lines at 12-inch (305-mm) intervals; label the distance from pile tip at 60-inch (1524-mm) intervals. Maintain markings on piles until driven. Bottom 100 ft of piles may be marked at 5 ft intervals.

C. Fabricate full-length piles by splicing lengths of steel H pile together. Accurately mill meeting ends of piles and bevel for welding. Maintain axial alignment of pile lengths. Maintain structural properties of pile across splice.

1. Continuously Welded Splices: Splice piles by continuously welding according to AWS D1.1/D1.1M for procedures, appearance and quality of welds, and methods used in correcting welding work.
2. Splice piles during field installation.

D. Fit and weld driving points to tip of pile according to manufacturer's written instructions and AWS D1.1/D1.1M for procedures, appearance and quality of welds, and methods used in correcting welding work.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Site Conditions: Do not start pile-driving operations until earthwork fills have been completed or excavations have reached an elevation of 6 to 12 inches (152 to 305 mm) above bottom of footing or pile cap.

3.2 DRIVING EQUIPMENT

A. Pile Hammer: Air-, steam-, hydraulic-, or diesel-powered type capable of consistently delivering adequate peak-force duration and magnitude to develop the ultimate capacity required for type and size of pile driven and character of subsurface material anticipated.

B. Hammer Cushions and Driving Caps: Between hammer and top of pile, provide hammer cushion and steel driving cap as recommended by hammer manufacturer and as required to drive pile without damage.

C. Leads: Use fixed, semifixed, or hanging-type pile-driver leads that hold the full length of pile firmly in position and in axial alignment with hammer.

3.3 DRIVING PILES

A. General: Continuously drive piles to elevations or penetration resistance established by dynamic load testing of piles. Establish and maintain axial alignment of leads and piles before and during driving.

B. Heaved Piles: Redrive heaved piles to tip elevation at least as deep as original tip elevation with a driving resistance at least as great as original driving resistance.

C. Driving Tolerances: Drive piles without exceeding the following tolerances, measured at pile heads:

1. Location: 2 inches (102 mm) from location indicated after initial driving, and 3 inches (152 mm) after pile driving is completed.
2. Plumb: Maintain 1 inch (25 mm) in 48 inches (1219 mm) from vertical, or a maximum of 4 inches (102 mm), measured when pile is aboveground in leads.
3. Batter Angle: Maximum 1 inch (25 mm) in 48 inches (1219 mm) from required angle, measured when pile is aboveground in leads.

D. Withdraw damaged or defective piles and piles that exceed driving tolerances, and install new piles within driving tolerances.

1. Fill holes left by withdrawn piles using cohesionless soil material such as gravel, broken stone, and gravel-sand mixtures. Place and compact in lifts not exceeding 72 inches (1830 mm).
2. Fill holes left by withdrawn piles as directed by Engineer.

E. Abandon and cut off rejected piles as directed by Engineer. Leave rejected piles in place, and install new piles in locations as directed by Engineer.

F. Cut off tops of driven piles square with pile axis and at elevations indicated.

G. Pile-Driving Records: Maintain accurate driving records for each pile**,** compiled and attested to by a qualified professional engineer. Include the following data:

1. Project name and number.
2. Name of Contractor.
3. Pile location in pile group and designation of pile group.
4. Date and time
5. Sequence of driving in pile group.
6. Pile dimensions.
7. Ground elevation.
8. Elevation of tips after driving.
9. Final tip and cutoff elevations of piles after driving pile group.
10. Records of redriving.
11. Elevation of splices.
12. Type, make, model, and rated energy of hammer.
13. Weight and stroke of hammer.
14. Type of pile-driving cap used.
15. Cushion material and thickness.
16. Actual stroke and blow rate of hammer.
17. Pile-driving start and finish times, and total driving time.
18. Time, pile-tip elevation, and reason for interruptions.
19. Number of blows for every 12 inches (305 mm) of penetration, and number of blows per 1 inch (25 mm) for the last 6 inches (152 mm) of driving.
20. Pile deviations from location and plumb.
21. Preboring, jetting, or special procedures used.
22. Unusual occurrences during pile driving.

H. Certified Piles Survey: Engage a land surveyor to prepare a piles survey showing final location of piles in relation to the property survey and existing benchmarks.

1. Notify Engineer when deviations from locations exceed allowable tolerances.

3.4 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:

1. Pile foundations.
2. Welded splices.

B. Testing Agency: Owner will engage a qualified testing agency to perform inspections and perform dynamic pile testing.

C. Tests and Inspections:

1. Dynamic Pile Testing: High-strain dynamic monitoring shall be performed and reported according to ASTM D 4945 during initial driving of at least 5 piles of each design load and during restriking of at least 8 percent of all piles. Test piles locations are shown in Figure 1-316216. Scope of testing may be reduced by Engineer-of-Record in response to actual conditions and test results. Locations of test piles may be revised by mutual agreement between Engineer-of-Record and contractor.
2. Weld Testing: In addition to visual inspection, welds shall be tested and inspected according to AWS D1.1/D1.1M and inspection procedures listed below, at testing agency's option. Correct deficiencies in Work that test reports and inspections indicate do not comply with the Contract Documents.

    a. Liquid Penetrant Inspection: ASTM E 165.
    b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
    c. Radiographic Inspection: ASTM E 94, minimum quality level "2-2T."
    d. Ultrasonic Inspection: ASTM E 164.

D. Steel H piles will be considered defective if they do not pass tests and inspections.

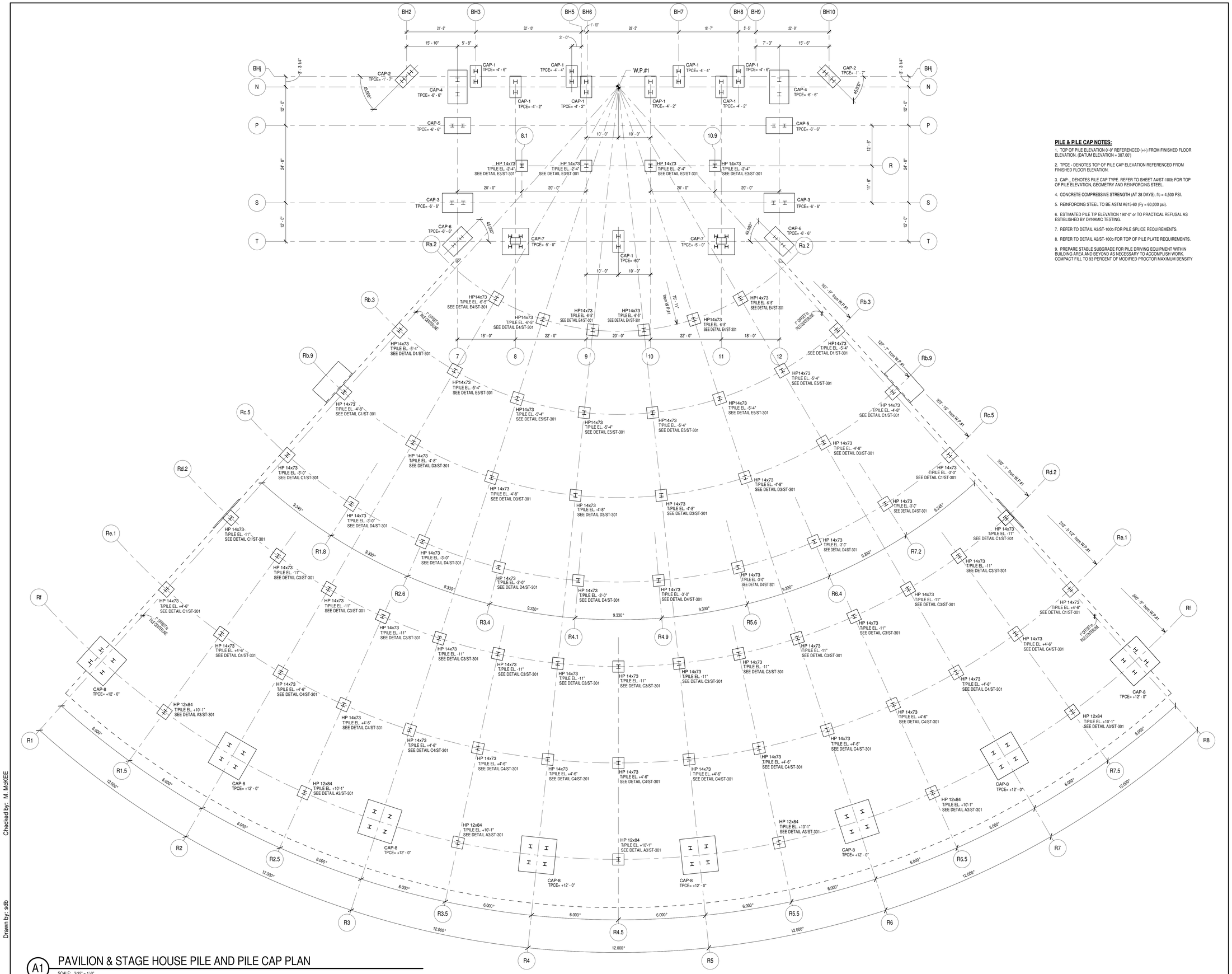
E. Prepare test and inspection reports.

3.5 DISPOSAL

A. Remove withdrawn piles and cutoff sections of piles from site, and legally dispose of them off Owner's property.

END OF SECTION 316216

ii. Updated Contract Drawings
   a. Signed and stamped, Amphitheater Pavilion and Stage House Pile & Pile Cap Plan St-100a; dated February 23, 2015
   b. Signed and stamped, Back of House Pile & Pile Cap Plan, Sections and Details St-100b; dated February 23, 2015



PILE & PILE CAP NOTES:

1. TOP OF PILE ELEVATION 0'-0" REFERENCED (+/-) FROM FINISHED FLOOR ELEVATION. (DATUM ELEVATION = 387.00')
2. TPCE - DENOTES TOP OF PILE CAP ELEVATION REFERENCED FROM FINISHED FLOOR ELEVATION.
3. CAP- DENOTES PILE CAP TYPE. REFER TO SHEET A4/ST-100b FOR TOP OF PILE ELEVATION, GEOMETRY AND REINFORCING STEEL.
4. CONCRETE COMPRESSIVE STRENGTH (AT 28 DAYS), f'c = 4,500 PSI.
5. REINFORCING STEEL TO BE ASTM A615-60 (Fy = 60,000 psi).
6. ESTIMATED PILE TIP ELEVATION 190'-0" or TO PRACTICAL REFUSAL AS ESTIBLISHED BY DYNAMIC TESTING.
7. REFER TO DETAIL A3/ST-100b FOR PILE SPLICE REQUIREMENTS.
8. REFER TO DETAIL A2/ST-100b FOR TOP OF PILE PLATE REQUIREMENTS.
9. PREPARE STABLE SUBGRADE FOR PILE DRIVING EQUIPMENT WITHIN BUILDING AREA AND BEYOND AS NECESSARY TO ACCOMPLISH WORK. COMPACT FILL TO 93 PERCENT OF MODIFIED PROCTOR MAXIMUM DENSITY

A1 PAVILION & STAGE HOUSE PILE AND PILE CAP PLAN

SCALE: 3/32" = 1'-0"

Drawn by: sdb

Checked by: M. McKEE

Issued / Revised

No.	Date	Description
1	02.17.2015	ISSUED FOR PILE CONSTRUCTION
2	02.23.2015	NYS PE STAMP APPLIED

JAMES F. KASPER — STATE OF NEW YORK — No. 050282 — PROFESSIONAL ENGINEER

Client

Gilbane
Onondaga Lakeview
Amphitheater

490 Restoration Way
Town of Geddes, NY

Project No. 14128.00

Westlake Reed Leskosky

1201 Broadway
Suite 1006
New York, New York 10001

T 212.564.8705
F 212.659.0050
www.WRLdesign.com

QPK DESIGN

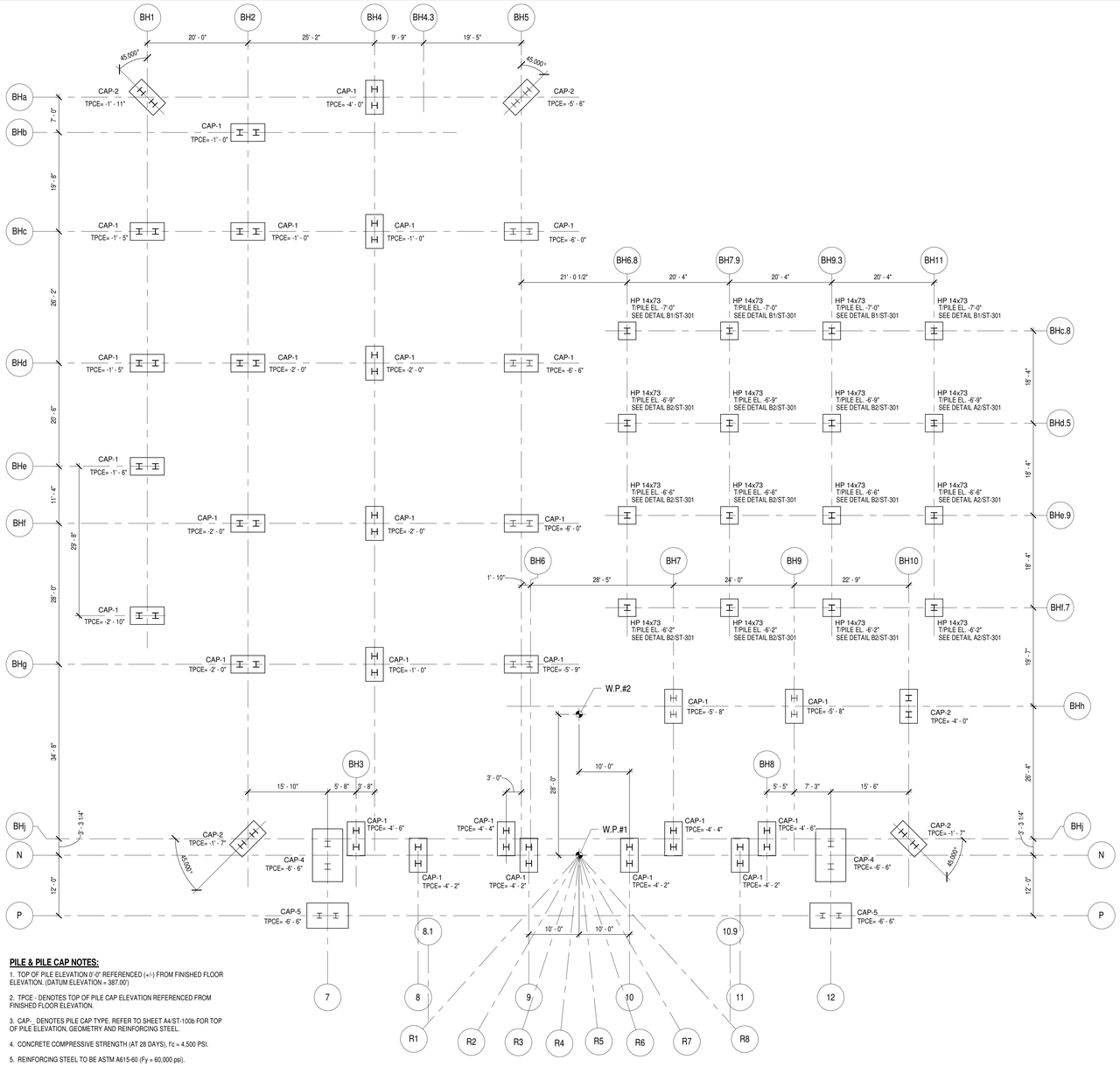
450 S Salina St.
Room 500
Syracuse, NY 13202

T 315.472.7806
F 315.472.7800

214264.00

AMPHITHEATER
PAVILION AND STAGE HOUSE
PILE & PILE CAP PLAN

ST-100a

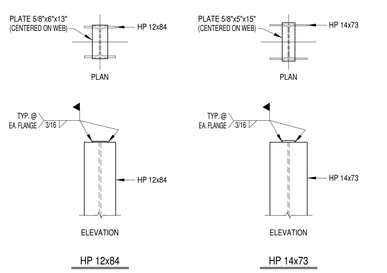


PILE & PILE CAP NOTES:

1. TOP OF PILE ELEVATION 0'-0" REFERENCED (+/-) FROM FINISHED FLOOR ELEVATION. (DATUM ELEVATION = 387.00')
2. TPCE - DENOTES TOP OF PILE CAP ELEVATION REFERENCED FROM FINISHED FLOOR ELEVATION.
3. CAP-_ DENOTES PILE CAP TYPE. REFER TO SHEET A4/ST-100b FOR TOP OF PILE ELEVATION, GEOMETRY AND REINFORCING STEEL.
4. CONCRETE COMPRESSIVE STRENGTH (AT 28 DAYS), f'c = 4,500 PSI.
5. REINFORCING STEEL TO BE ASTM A615-60 (Fy = 60,000 psi).
6. ESTIMATED PILE TIP ELEVATION 190'-0" or TO PRACTICAL REFUSAL AS ESTIBLISHED BY DYNAMIC TESTING.
7. REFER TO DETAIL A3/ST-100b FOR PILE SPLICE REQUIREMENTS.
8. REFER TO DETAIL A2/ST-100b FOR TOP OF PILE PLATE REQUIREMENTS.
9. PREPARE STABLE SUBGRADE FOR PILE DRIVING EQUIPMENT WITHIN BUILDING AREA AND BEYOND AS NECESSARY TO ACCOMPLISH WORK. COMPACT FILL TO 93 PERCENT OF MODIFIED PROCTOR MAXIMUM DENSITY

B1 PILE AND PILE CAP PLAN

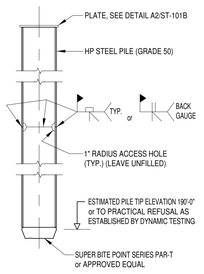
SCALE: 3/32" = 1'-0"



D:PILECAPS

A2 TOP OF HP PILE DETAILS

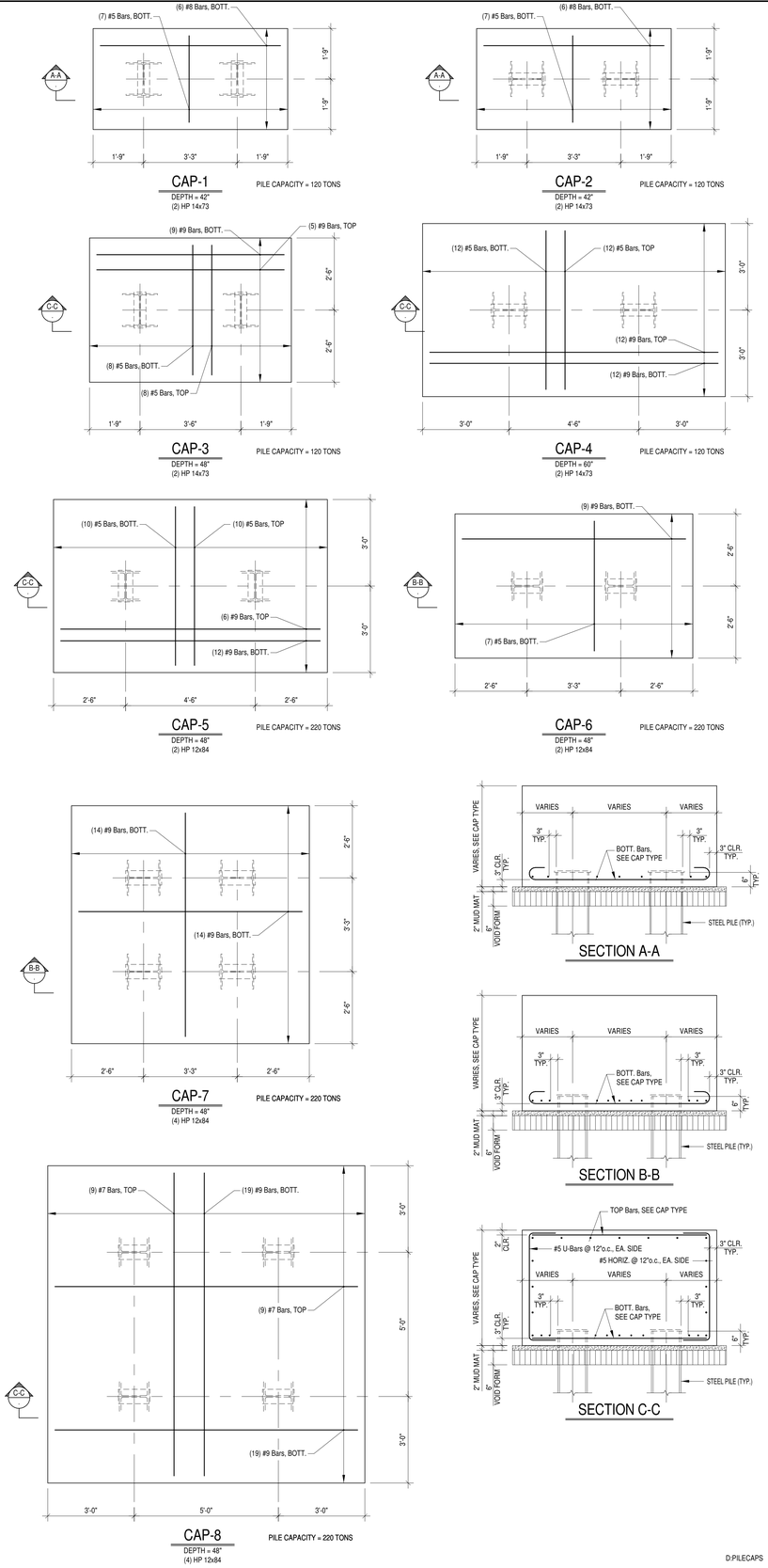
SCALE: NO SCALE



D:PILECAPS

A3 HP PILE SPLICE DETAIL

SCALE: NO SCALE

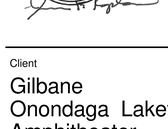


D:PILECAPS

A4 PILE CAP TYPES

SCALE: NO SCALE

Issued / Revised		
No.	Date	Description
1	02.17.2015	ISSUED FOR PILE CONSTRUCTION
2	02.23.2015	NYS PE STAMP APPLIED



Client

Gilbane
Onondaga Lakeview Amphitheater

490 Restoration Way
Town of Geddes, NY

Project No. 14128.00

Westlake Reed Leskosky

1201 Broadway
Suite 1006
New York, New York 10001

T 212.564.8705
F 212.659.0050
www.WRLdesign.com

QPK DESIGN

450 S Salina St.
Room 500
Syracuse, NY 13202

T 315.472.7806
F 315.472 7800

214264.00

BACK OF HOUSE
PILE & PILE CAP PLAN, SECTIONS AND DETAILS

ST-100b

Checked by: M. McKEE

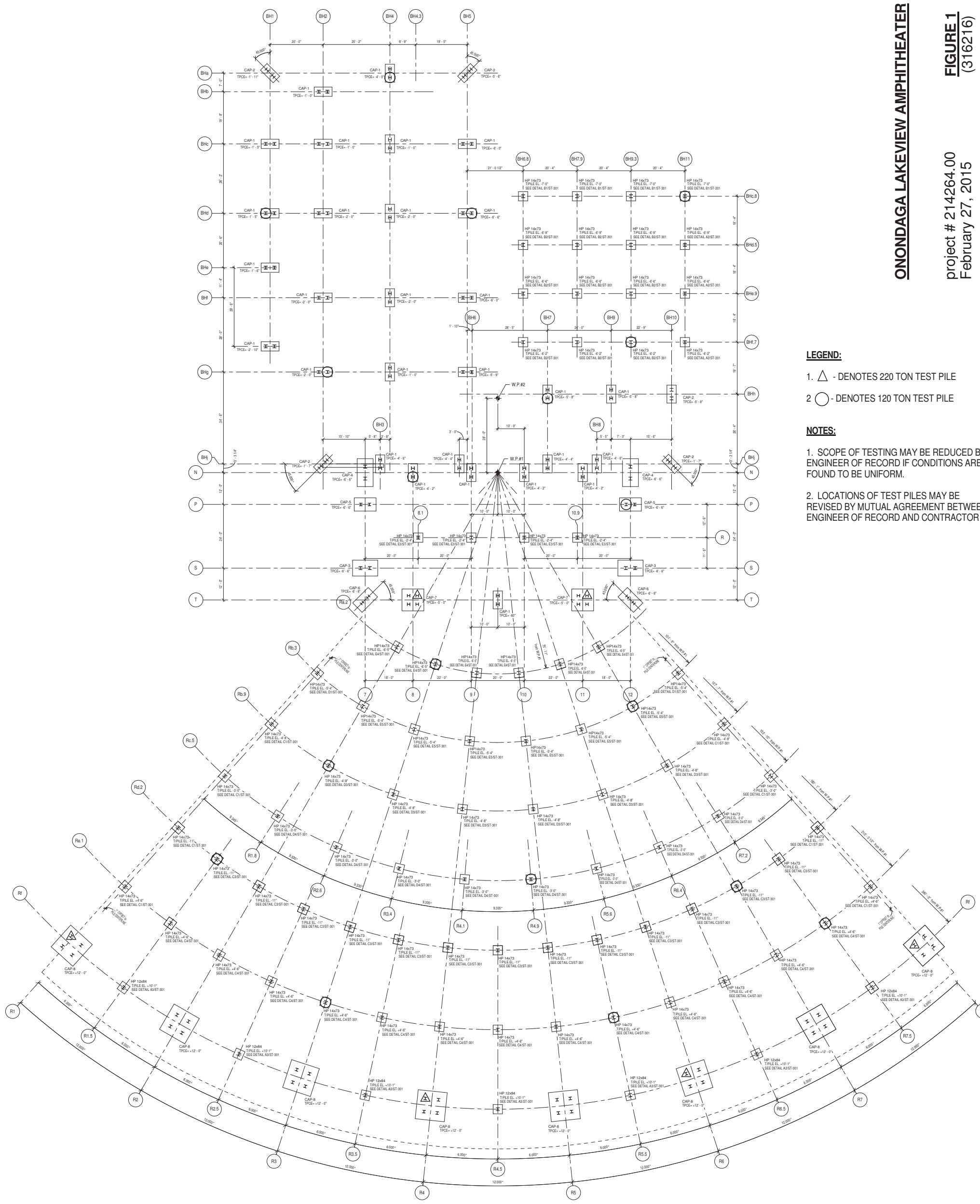
Drawn by: sdb

iii. Test Pile Location Plan; dated February 27, 2015 as prepared by John P. Stopen Engineering

ONONDAGA LAKEVIEW AMPHITHEATER

project # 214264.00
February 27, 2015

FIGURE 1
(316216)



TEST PILE LOCATION PLAN

LEGEND:

1. △ - DENOTES 220 TON TEST PILE

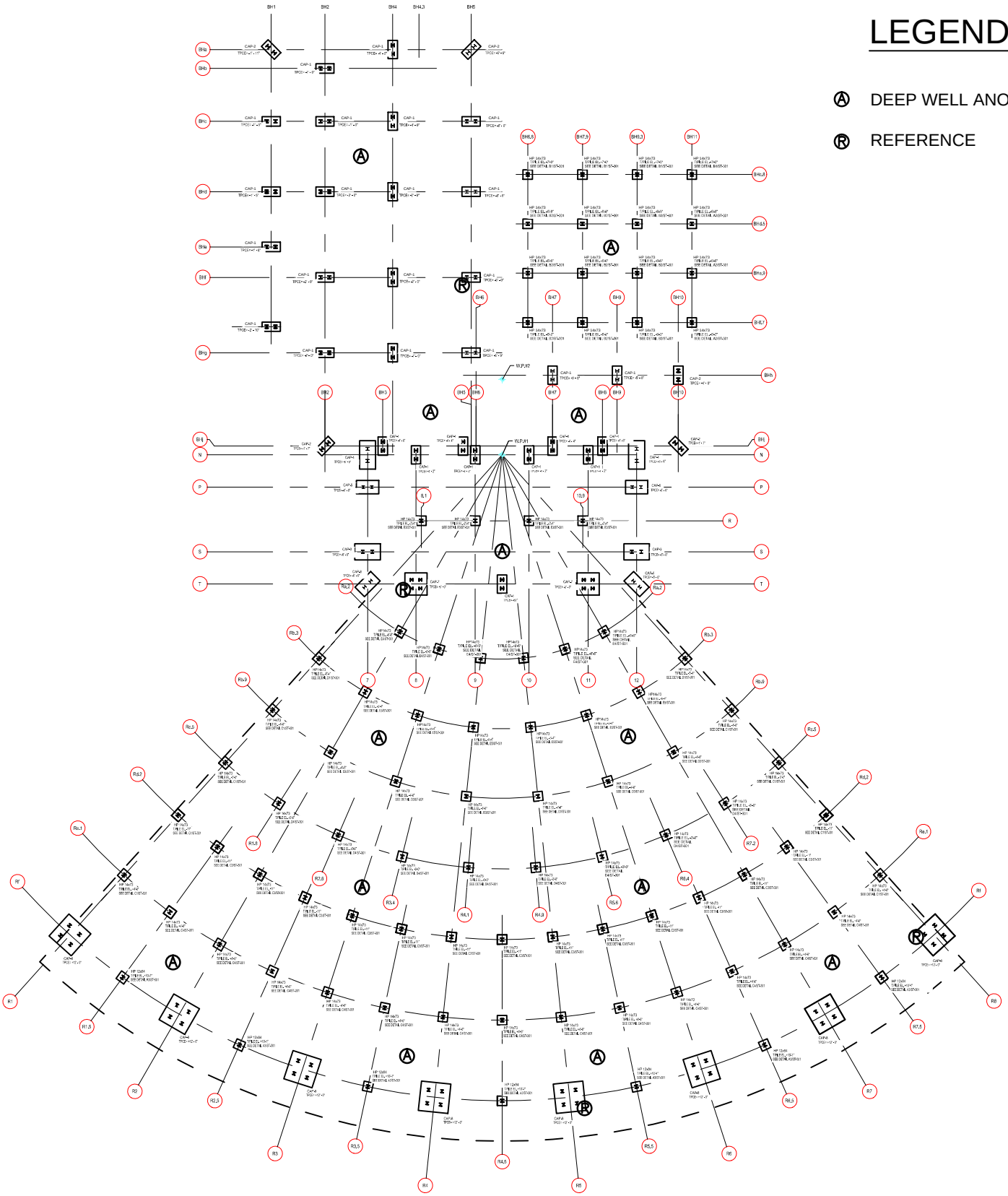
2 ◯ - DENOTES 120 TON TEST PILE

NOTES:

1. SCOPE OF TESTING MAY BE REDUCED BY ENGINEER OF RECORD IF CONDITIONS ARE FOUND TO BE UNIFORM.

2. LOCATIONS OF TEST PILES MAY BE REVISED BY MUTUAL AGREEMENT BETWEEN ENGINEER OF RECORD AND CONTRACTOR

iv. Cathodic Protection Details (preliminary); dated February 25, 2015 as prepared by CorrTech, Inc.
   a. CP-1 Planview
   b. CPD-1 Detail Drawings
   c. CP-1 Deepwell Anode Assembly



LEGEND:

Ⓐ DEEP WELL ANODE BED

Ⓡ REFERENCE

ENGINEERS:

CORRTECH

25 SOUTH STREET
HOPKINTON, MA 01748
(508) 435-0090

CLIENT:

Gilbane Building Company
Onondaga County, NY

PROJECT:

Gilbane Lakeview Ampitheater
Onondaga Lake

DWN BY:	CHK BY:	APP BY:
PB	00	00

JOB NO.: 8035

FILE: CP-1

DATE: 00/00/0000

SCALE: N.T.S.

DWG. NO.: CP–1

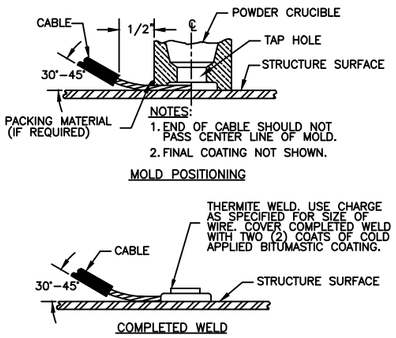
SHEET: 1

NO.	REVISIONS	DATE	BY

DRAWING TITLE:

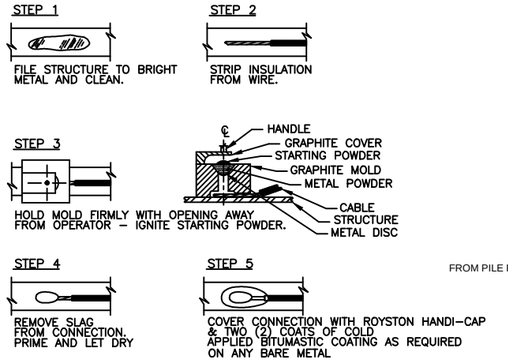
Planview

Cathodic Protection Details (preliminary); dated February 25, 2015 as prepared by CorrTech, Inc.: CP-1 Planview



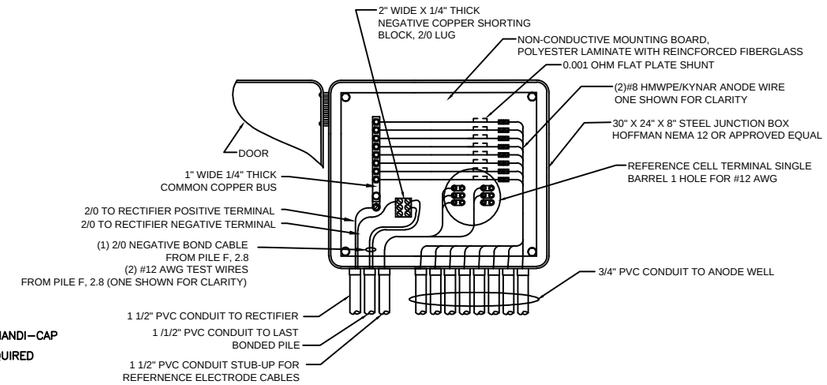
MOLD POSITIONING

COMPLETED WELD



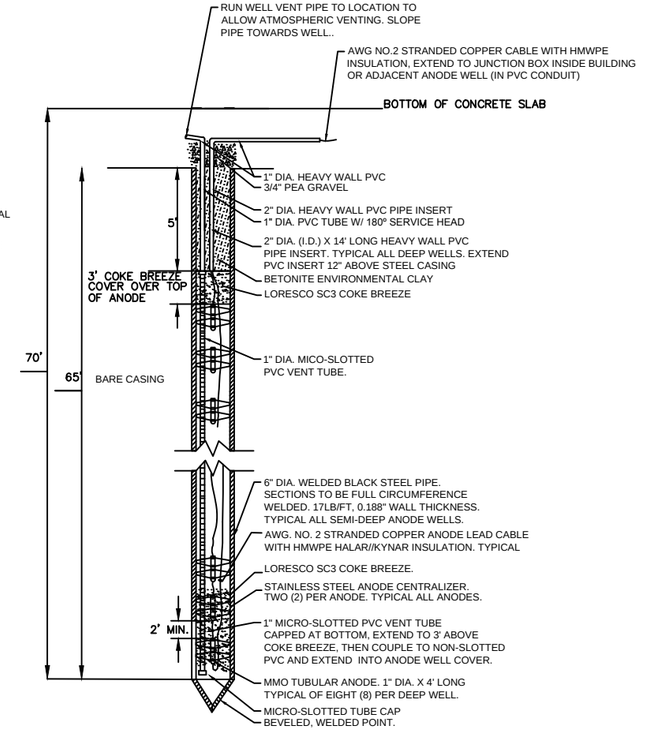
THERMITE WELD

3 CPD–1



JUNCTION BOX

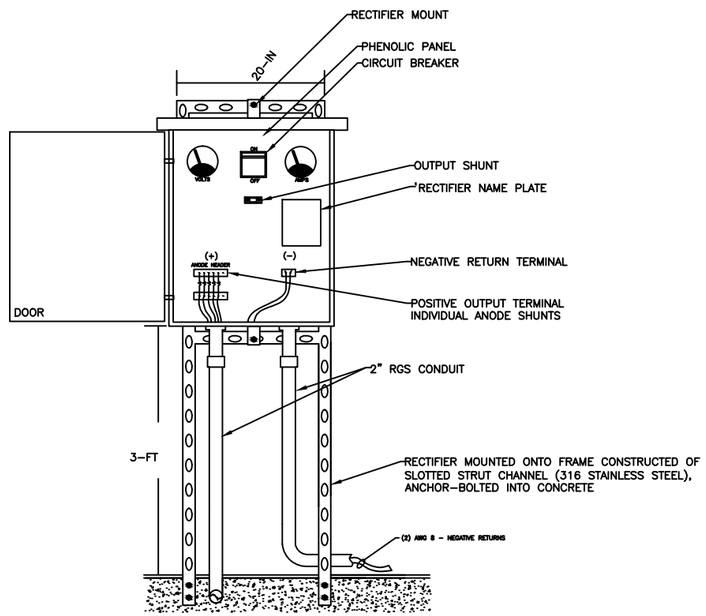
1 CPD–1



TYPICAL SEMI-DEEP WELL INSTALLATION

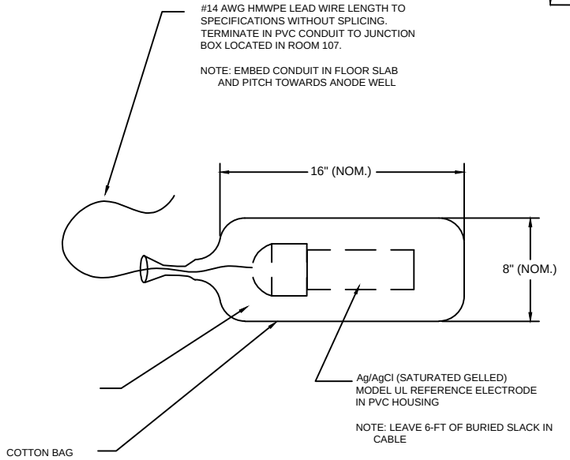
N.T.S.

2 CPD–1



RECTIFIER

4 CPD–1



REFERENCE ELECTRODE

5 CPD–1

ENGINEERS:
25 SOUTH STREET
HOPKINTON, MA 01748
(508) 435-0090
CORRTECH

Gilbane Building Company
Onondaga County, NY

Gilbane Lakeview Amphitheater

CLIENT:

PROJECT:

DWN BY:	CHK BY:	APP BY:
PB	00	00

JOB NO.: 8035

FILE: CP-1

DATE: 02/25/2015

SCALE: N.T.S.

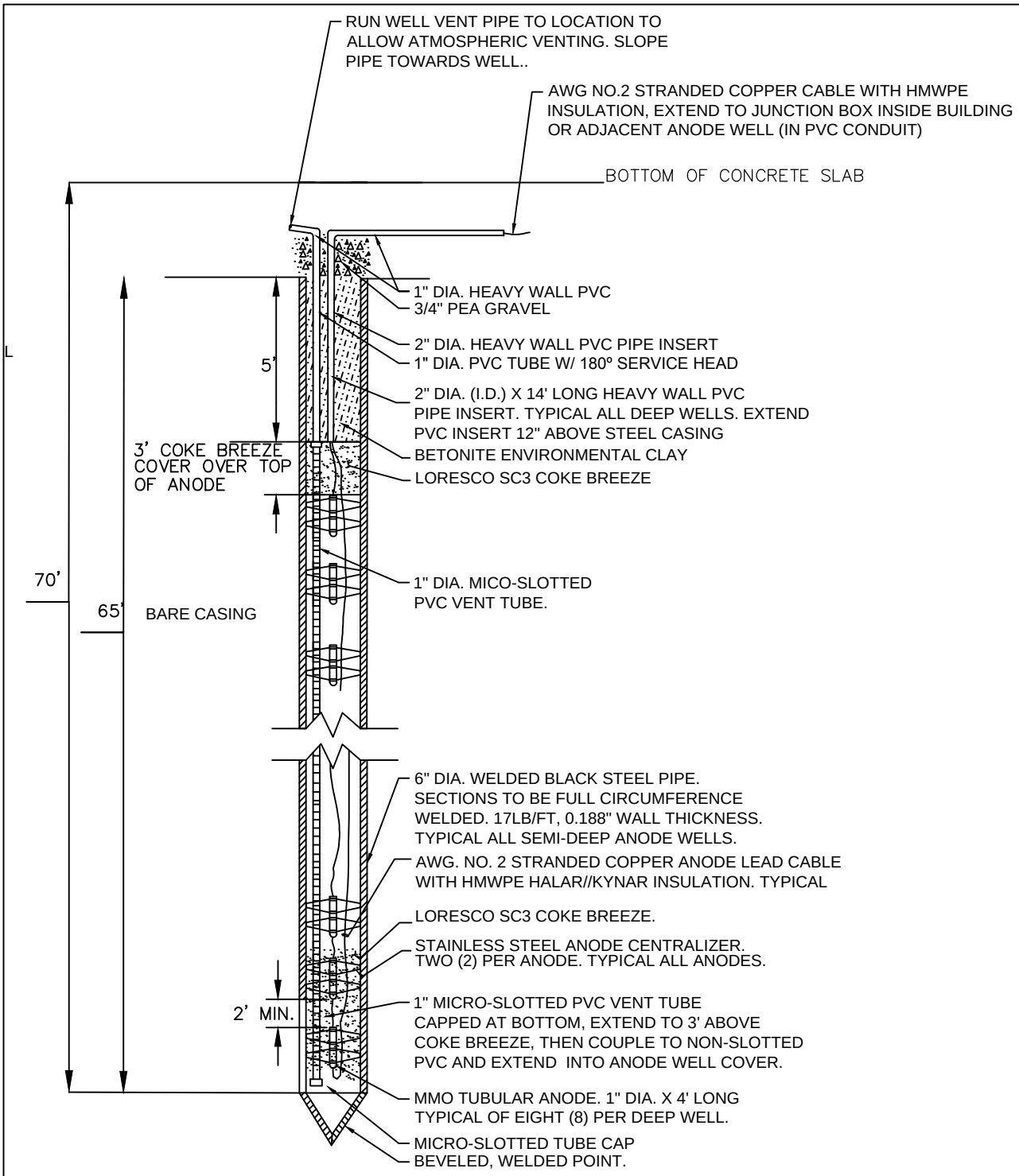
NO.	REVISIONS	DATE	BY

DRAWING TITLE: Detail Drawings

DRAWING NO.: CPD-1

SHEET: 1 OF 1

Cathodic Protection Details (preliminary); dated February 25, 2015 as prepared by CorrTech, Inc.: CPD-1 Detail Drawings



TYPICAL SEMI-DEEP WELL INSTALLATION

N.T.S.

2
CPD–1

CORRTECH

CLIENT:
Gilbane Building Company
Onondaga County, NY

PROJECT:
Gilbane Lakeview Ampitheater
Onondaga Lake

DWN BY:	CHK BY:	APP BY:
PB	00	00

JOB NO.: 8035
FILE: CP-1
DATE: 00/00/0000
SCALE: N.T.S.
DWG. NO.: CP–1
SHEET: 1

NO.	REVISIONS	DATE	BY

DRAWING TITLE:
Deepwell Anode Assembly

Cathodic Protection Details (preliminary); dated February 25, 2015 as prepared by CorrTech, Inc.: CP-1 Deepwell Anode Assembly

Simone, Matthew J.

From: Simone, Matthew J.
Sent: Wednesday, March 04, 2015 11:46 AM
To: 'Smith, Tracy (DEC)'
Cc: 'bduclos@CSCOS.com'; Astheimer, Joseph M.; Reinhardt, Charles; Mincher, Maxwell; 'ArchieWixson@ongov.net'; 'travisglazier@ongov.net'; 'Robert M. Palladine'; 'Hesler, Donald (DEC)'
Subject: RE: Pile Installation Work Plan
Attachments: OLA Steel Pile Spec Signed.pdf

Tracy,

Please see attached for a revised signed and sealed specification for the steel piles. If you would prefer I re-send the original correspondence with the revised specification included, I certainly will.

Regards,

MJS

-----Original Message-----
From: Smith, Tracy (DEC) [mailto:tracy.smith@dec.ny.gov]
Sent: Tuesday, March 03, 2015 1:35 PM
To: Simone, Matthew J.
Subject: RE: Pile Installation Work Plan

Thanks Matt.

-----Original Message-----
From: Simone, Matthew J. [mailto:MSimone@GilbaneCo.com]
Sent: Tuesday, March 03, 2015 1:32 PM
To: Smith, Tracy (DEC); Charles Brooks
Cc: bduclos@CSCOS.com; Astheimer, Joseph M.; Reinhardt, Charles; Mincher, Maxwell; ArchieWixson@ongov.net; travisglazier@ongov.net; Robert M. Palladine; Hesler, Donald (DEC)
Subject: RE: Pile Installation Work Plan

Tracy,

We are in the process of revising the specification, as we noted the same concern following the submission of the work plan. Our contractors and the collective team are aware that there shall be no removal of any piles. Immediately upon receipt of the revised specification, I will forward for your use and review.

Thank you again.

Regards,

MJS

-----Original Message-----
From: Smith, Tracy (DEC) [mailto:tracy.smith@dec.ny.gov]

Sent: Tuesday, March 03, 2015 1:24 PM
To: Charles Brooks
Cc: Simone, Matthew J.; bduclos@CSCOS.com; Astheimer, Joseph M.; Reinhardt, Charles; Mincher, Maxwell; ArchieWixson@ongov.net; travisglazier@ongov.net; Robert M. Palladine; Hesler, Donald (DEC)
Subject: RE: Pile Installation Work Plan

Chuck,

We are still reviewing this work plan. However, there is one change in the Steel Piles specification included in the Pile Installation Work Plan dated March 2, 2015 that will need to be made. In this specification, Section 3.3.D. should be removed since piles that are driven should not be removed and backfilled with cohesion-less soil. Instead, the pile would need to be left in place. Any ongoing pile driving will need to incorporate this change and a revised specification will need to be submitted to us. Please send a revised specification so we can complete our review. If we have any other questions or comments we will let you know.

Tracy

-----Original Message-----
From: Smith, Tracy (DEC)
Sent: Monday, March 02, 2015 3:51 PM
To: 'Charles Brooks'
Cc: Simone, Matthew J. (MSimone@GilbaneCo.com); bduclos@CSCOS.com; Astheimer, Joseph M.; Reinhardt, Charles; Mincher, Maxwell (MMincher@GilbaneCo.com); ArchieWixson@ongov.net; travisglazier@ongov.net; Robert M. Palladine; Hesler, Donald (DEC)
Subject: RE: Pile Installation Work Plan

Chuck,

We are reviewing this submittal and hope to get back to you shortly. However, since there are no significant changes to installation of the piles in this installation work plan compared to the October 22, 2014 C&S submittal our November 4, 2014 letter (attached) regarding the foundation piles is still applicable so pile driving can commence while we complete our review. If you have any questions please contact me.

Tracy

-----Original Message-----
From: Charles Brooks [mailto:cbrooks@cscos.com]
Sent: Monday, March 02, 2015 2:00 PM
To: Smith, Tracy (DEC); Hesler, Donald (DEC)
Cc: Simone, Matthew J. (MSimone@GilbaneCo.com); bduclos@CSCOS.com; Astheimer, Joseph M.; Reinhardt, Charles; Mincher, Maxwell (MMincher@GilbaneCo.com); ArchieWixson@ongov.net; travisglazier@ongov.net; Robert M. Palladine
Subject: Pile Installation Work Plan

Tracy, Don,

Please see the attached updated work plan for the pile installation. As we discussed, this is Gilbane's update to the pile installation work plan that we submitted in the Fall with their updates based on detailed design.

Please let us know if you need anything else.

Chuck Brooks, P.E., P.Eng.
Senior Project Engineer
C&S Engineers
cbrooks@cscos.com
office: (315) 455-2000 | direct: (315) 703-4196
cell: (315) 729-4383

-----Original Message-----
From: Simone, Matthew J. [mailto:MSimone@GilbaneCo.com]
Sent: Monday, March 02, 2015 1:43 PM
To: Charles Brooks
Cc: Robert Duclos; Bob Catalina; ArchieWixson@ongov.net; Robert M. Palladine; Roger, Thomas; Bacher, Lawrence C.; Astheimer, Joseph M.; Mincher, Maxwell; Reinhardt, Charles
Subject: RE: Piles

Chuck,

Please see attached for the update to the pile installation work plan for submission to NYSDEC. If you have any comments please let me know, and I will edit ASAP.

Regards,

MJS

-----Original Message-----
From: Charles Brooks [mailto:cbrooks@cscos.com]
Sent: Sunday, March 01, 2015 7:48 PM
To: Simone, Matthew J.; Bacher, Lawrence C.; Astheimer, Joseph M.; Mincher, Maxwell
Cc: Robert Duclos; Bob Catalina; ArchieWixson@ongov.net; Robert M. Palladine
Subject: Piles

Larry, Matt,

As we are driving piles on Tuesday, there are a couple of critical items we need to get done as early as possible tomorrow.

Larry,

We received the signed and sealed pile and pile cap drawings. However, before we can start driving piles, we still need the signed and sealed steel pile specification. If you can submit the signed and sealed cast in place concrete spec as well that would be great.

Matt,

We need to get the steel pile work plan in to DEC tomorrow morning. Call me or Bob Palladine first thing if you need help pulling it together.

Chuck Brooks, P.E., P.Eng
Senior Project Engineer
C&S Engineers
Office: 315-455-2000
Direct: 315-703-4196
Cell: 315-729-4383